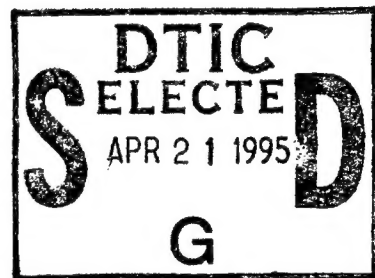
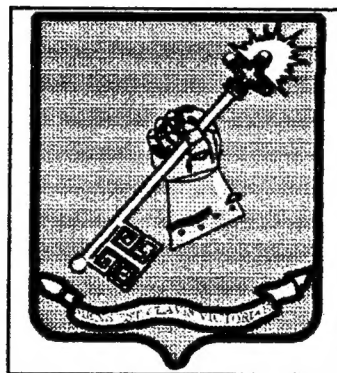


# **FUTURE COMBAT IN URBAN TERRAIN: IS FM 90-10 STIL RELEVANT?**

**A Monograph  
by**

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Ordnance**



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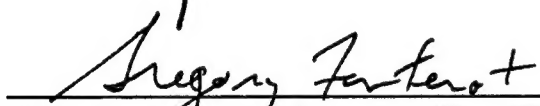
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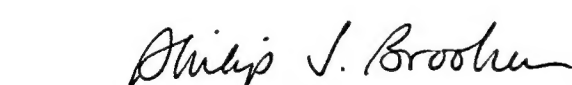
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## **ABSTRACT**

### **FUTURE COMBAT IN URBAN TERRAIN: IS FM 90-10 STILL RELEVANT?**

**by Major Steven P. Goligowski, USA, 53 pages.**

This monograph examines current US Army doctrine for military operations in urbanized terrain (MOUT), as presented in US Army Field Manual (FM) 90-10. The purpose of this examination is to determine whether the doctrine contained in the current 1979 version of FM 90-10 is still relevant to conditions on the contemporary urban battlefield. In those areas where current doctrine is found to be outdated or irrelevant, the monograph suggests improvements to bring doctrine up to date.

The monograph begins by reviewing current literature on the subject of MOUT. This information is used to determine the significant features of the contemporary urban combat environment. The research data examined in the monograph indicates that MOUT is becoming both more frequent and a more decisive component in contemporary warfare.

The monograph next presents three case studies of recent urban combat between modern, mechanized, non-indigenous forces and lighter non-mechanized, indigenous forces. The case studies used are: the American intervention in the Dominican Republic, 1965-1966; The battle of Hue, Republic of Vietnam, 1968; and British operations in Belfast, Northern Ireland, 1969-1985. The purpose of these case studies is to provide counterpoints to the FM 90-10 focus on Warsaw Pact-style mechanized forces. These counterpoints are used to test the adaptability of current doctrine to meet a range of threat forces.

Next, the doctrine contained in FM 90-10 concerning urban offensive and defensive operations is analyzed using data from the previous literature research and from the case studies. The goal is to determine if the doctrine contained in FM 90-10 would have been relevant if used in situations like those described in the case studies. This analysis showed that significant portions of FM 90-10 are outdated and no longer meet the needs of an Army facing peacemaking and peacekeeping duties in a multi-polar world.

The monograph concludes that a significant revision of FM 90-10 is badly needed. The goal of this revision should be to act as a catalyst that will also lead to reexamination of the Army's training system, organizational structure, and weapons design system as they effect the preparedness of the Army to effectively fight and win in a MOUT environment. In the past, the US Army has had a history of relearning how to fight MOUT only after urban fighting occurs. This monograph suggests we may no longer be willing or politically able to pay the costs in blood to relearn lessons in this way. The only alternative is to remain prepared for MOUT even in times of peace.

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## INTRODUCTION

Urban combat is a challenge soldiers have faced since cities began. Thucydides did not indicate urban combat was unusual when he described a battle in the streets of Plataea 2,400 years ago.<sup>1</sup> This ancient battle had much in common with contemporary urban combat, which is known as military operations on urbanized terrain (MOUT). Surprise, unobserved movement, use of city structures and barricades, exploitation of superior intelligence about the city, and high casualties occurred at Plataea. All of these elements are still discussed in US Army MOUT doctrine. Yet, these similarities cannot hide the fact that tactics, weapons, and missions have changed. We must constantly examine doctrine in the light of new conditions and new experiences. The latest edition of US Army Field Manual (FM) 90-10, Military Operations on Urbanized Terrain (MOUT), was published in 1979. A number of critics have charged that the manual is out of date and out of touch with modern urban conditions.<sup>2</sup> These critics believe FM 90-10 ignores operations against an enemy that is dissimilar to US forces in organization, equipment, or MOUT doctrine, and this makes our doctrine flawed. The role of doctrine is explained in US Army Field Manual (FM) 100-5, Operations:

Doctrine is the statement of how America's Army, as part of a joint team, intends to conduct war and operations other than war. It is the condensed expression of the Army's fundamental approach to fighting, influencing events in operations other than war, and deterring actions detrimental to national interests. As an authoritative statement, doctrine must be definitive enough to guide specific operations, *yet remain adaptable enough to address diverse and varied situations worldwide.*<sup>3</sup> [Emphasis added]

The purpose of this paper is to examine contemporary US MOUT doctrine as stated in FM 90-10, and determine if that doctrine proves relevant based on recent historical experience. The goal for the army must be a viable doctrine with sufficient adaptability to meet the diverse conditions of the post-Cold War world.

Despite the critics, there is little professional discussion of MOUT in the US military. John Mahan conducted a survey of military professional journals spanning the five years from 1978

to 1982.<sup>4</sup> He found only thirteen articles related to MOUT. This author conducted a survey of the same military professional journals for the five years from 1989 to 1993 and found only nine articles related to MOUT. A reasonable conclusion is that few articles are published because there is little interest in the subject. Soldiers have traditionally trained for battle in rural areas. Historically, few military leaders have tried to change this focus. Illustrative of this neglect is the survey of MOUT training conducted by David Reiss in 1983. Reiss found doctrinal cautions to avoid MOUT effectively diverted the attention of the army away from the subject.<sup>5</sup> Reiss also stated:

Conditions and standards are not identified in army doctrine. Moreover, units are not required to show proficiency in MOUT skills. All of this contributes to the low priority MOUT training receives in units.<sup>6</sup>

The author's research indicates that the situation has not improved. FM 90-10 still suffers from the same shortcomings Reiss identified. The army remains reluctant to think about urban combat. One of the author's goals is to confront this reluctance by examining where we are, and where we need to go, with MOUT doctrine.

The critics of US MOUT doctrine find many things wrong with FM 90-10 as written. A partial list includes failures to address the issues of population control, precision guided munitions (PGM), lasers, psychological operations, civil affairs, and rules of engagement (ROE), as they affect MOUT. Many other topics could be added to the list. Rather than attempt to address all possible sources of concern, this paper will focus on one fundamental topic that has a significant impact on many other areas. That topic is FM 90-10's failure to address the threat of light indigenous armed forces in an urban environment. The need to focus on these forces is based on three assumptions. First, the doctrine contained in FM 90-10 is still relevant to urban combat against mechanized forces in a general war. Second, the US will continue to participate in peacekeeping, peacemaking, and humanitarian assistance operations.



Third, MOUT required as part of peacekeeping, peacemaking, or humanitarian assistance operations will have a high probability of involving operations against indigenous, non-mechanized forces.

Based on these assumptions, the author developed an analytic methodology that focused on asymmetric forces. First, the author will present three case studies of mechanized non-indigenous armies that fought lightly armed indigenous forces in cities. The case studies were selected as counterpoints to the enemy described in FM 90-10 and to test the adaptability of US MOUT doctrine. Next, the author will analyze FM 90-10 for relevance to contemporary MOUT conditions. Third, the author will present conclusions about current doctrine's adaptability and make recommendations to enhance the effectiveness and adaptability of MOUT doctrine.

Before examining the case studies, it is important to understand the historical roots of FM 90-10. Current US MOUT doctrine is based on American experience in WW II.<sup>7</sup> Most of that experience was gained during the fighting in Europe.<sup>8</sup> The lessons of that experience appeared in the 1952 edition of FM 31-50, Combat in Fortified Areas and Towns. The manual contains a great deal of detail about a wide range of subjects.<sup>9</sup> In forty-six pages the manual discusses urban terrain analysis, selecting urban objectives, night operations, looting, sources of intelligence, combat support and service support units, urban assault techniques, and training techniques. The one subject that is glossed over is the enemy. One gets the sense that the enemy is considered almost irrelevant. The theme of the manual is to form firepower-oriented combined arms teams to blast the enemy out of his defenses while minimizing friendly casualties. Control of local civilians is mentioned only twice. If the civilians are friendly to US forces:

Control of civilians in a built-up area requires prompt and effective disposition of all persons unwilling or unable to contribute to the defensive effort.<sup>10</sup>

In cases where the local civilians are considered unfriendly:

Spies and fifth columnists are ceaselessly sought out and dealt with firmly. Constant vigil is maintained to prevent sabotage of equipment. Preparations and plans are made to deal with sudden movements by civilians either into or out of the built-up area.<sup>11</sup>

Evidently control of the civilian population was not considered a critical element of urban operations. This document remained official doctrine for twelve years.

The next version of FM 31-50 appeared in 1964. It devotes only twenty-nine pages to MOUT. Most of the essentials of the previous edition are still present, but in less detail. This manual eliminates all discussion of training techniques for MOUT, and greatly reduces discussion of combat support and service support functions. On the other hand, the manual does address some new topics. It discusses nuclear, biological, and chemical weapons; counter-guerrilla operations on urban terrain; and goes into more depth on techniques and resources for control and care of civilians. It provides ideas such as:

Loudspeakers and leaflets can be used to facilitate issuance of orders and instructions necessary for control of the civilian population. Psychological warfare equipment and trained personnel to operate it are available upon request from supporting psychological warfare units.<sup>12</sup>

Still, the 1964 manual has many similarities with the 1952 edition. Once again the enemy is hardly mentioned. Also, the emphasis remains on defeating the enemy with overwhelming firepower. Shortly after the publication of the 1964 edition, the army began its long involvement in Vietnam, which may have contributed to the manual's longevity. It remained official doctrine for fifteen years, until the current FM 90-10 was published in 1979.

The new FM 90-10 was produced by the US Army Training and Doctrine Command (TRADOC). The previous manuals had been produced by the US Army Infantry School. In some respects FM 90-10 was a departure from the past. Besides the new numerical designation, the subject matter had become more focused. References to 'fortified areas' were gone. The manual dealt strictly with 'urbanized terrain,' meaning towns and cities. Another significant change was the size of the document. The manual now had 178 pages, including

seven appendixes to cover specialized topics like urban terrain analysis, demolitions, and armored forces. Much of this increase was due to the use of larger type and more pictures and diagrams to make the manual easier to read and understand, not to more information. Underneath the packaging changes the threads of WWII experience continued unbroken. The goal remained to create combined arms teams capable of overwhelming the enemy with firepower. There were two significant substantive changes in this document. One was the announcement that the environment discussed was exclusively based on Western Europe. The other was the inclusion of details about the enemy, his organization, doctrine, and capabilities. Only one type of enemy was discussed, and that enemy used Soviet doctrine. Soviet doctrine, like American, was based on WWII experience.<sup>13</sup> The similarities of those experiences resulted in doctrines that were very similar.<sup>14</sup> The question today is whether WWII era urban doctrine is feasible, adaptable, and effective under current urban combat conditions. To answer that question it is necessary to briefly review the conditions that make MOUT a form of combat that many experts believe is becoming a greater threat each year.

John Pettine, in his analysis of helicopter operations in an urban environment, describes unique aspects of urban environments:

The challenge facing any commander about to fight in an urban area is a formidable one. He is faced with a three-dimensional ground battle and an air battle which is drastically compressed in usable airspace. The urban area offers excellent cover and concealment while severely limiting fields of fire and observation. Intelligence acquisition is reduced while the need for timely intelligence becomes even more acute. The complex and varied terrain will hamper mobility and communications. The command and control of ground units will be reduced to a level of individual fighting units, possibly down to squad size. However, in spite of this decentralized control, the fighting units must still be mutually supporting. Combat will be intense at close range, and logistic resupply will be critical.<sup>15</sup>

An equally compelling description of the MOUT environment is provided by R. J. Yeoman in his study of the urban combat environment:

Combat in builtup areas is fragmented, generally slow in developing, and time consuming in execution; it usually produces heavier-than-normal casualties and it demands careful, detailed and intelligent logistical and combat service support planning. The advantage usually lies with the defender. MOBA is distinguished from other tactical forms in several key respects. The almost inevitable presence of a civilian populace imposes constraints and responsibilities on both

protagonists. The population inhabits the urban battlefield, which, like any battlefield, is comprised of terrain features. Those features, however, have unique aspects that must be appreciated. The irregular natural features of the countryside are replaced by more regular manmade structures. The buildings have vertical walls instead of gradual slopes. Streets become avenues of approach as well as killing zones. Historically, attackers have caused the greatest damage to cities, and the resulting rubble usually has accrued to the defender's advantage. Subterranean lines of communication often exist, again benefiting the defender.<sup>16</sup>

This author found most documents about MOUT were in close agreement about its inherent challenges. MOUT is characterized by poor communications, difficult command and control, reliance on small unit leadership, difficult target acquisition, short engagement ranges, reduced transportation and fire support for front line soldiers, and significant difficulties in providing logistics support to the front line.<sup>17</sup> Yeoman points out that these conditions change slowly, if at all, because technological advances, on balance, aid the urban defender as much or more than they aid the urban attacker.<sup>18</sup>

While the underlying physical conditions of urban combat change very little over time, its probability of occurrence and political significance to the outcome of the war are growing at a rapid and accelerating pace.

Looking first at the growing political significance of MOUT, we find that politics are changing the war-fighting methods of belligerents. Governments are finding it increasingly difficult to live with the political costs that accompany the heavy use of firepower within cities.<sup>19</sup> This is often the case even when casualties are overwhelmingly made up of enemy forces and their supporters. This sensitivity to casualties is exploited by rebel forces when they initiate urban combat in the hope that civilian casualties and property damage will reduce popular support for the government.<sup>20</sup> Soldiers must understand that political considerations play an increasingly important role in determining how MOUT must be conducted if the government is to win the political war as well the military battle.

Looking next at the increasing frequency of urban combat, we find both political and environmental factors involved. One political factor is the fall of the Soviet Union. It was

generally accepted during the Cold War that the Soviet Union was the only threat that could militarily defeat the United States. This led the US to focus its doctrine on how best to defeat the Soviets. It appeared that the United States could safely ignore MOUT doctrine because Soviet doctrine called for the avoidance of urban combat. This line of reasoning collapsed along with the Soviet Union. Military missions have grown more diverse, with peacekeeping, peacemaking and humanitarian assistance roles becoming more common. The US Army faces a greater probability of urban combat because the National Command Authority is more willing to risk US forces in theaters and on missions that would not have been seen as vital to national interests while the Soviet Union existed.

Another political factor working to increase the probability of urban combat is the recession of support by the former Soviet Union and China for violent movements of national liberation. Both governments were frequent supporters of these movements, providing both equipment and doctrinal training. Both Soviet and Chinese doctrine favored rural over urban operations. These doctrines played a significant role in training potential US opponents around the world to avoid urban combat. With the Soviet Union gone and Chinese support for revolutionary forces greatly reduced, nations wanting to violently confront the US have less access to materiel resources, and thus more incentive to innovate and adapt. The loss of active role models preaching doctrines of rural combat make urban combat more likely even if all other conditions remain unchanged.

Changes in the physical environment also increase the probability of urban combat for US forces. One of the most dramatic of these changes is the urbanization of the world's population.<sup>21</sup> A recent RAND study reports:

A demographic upheaval of unprecedented proportions is today transforming almost the entire developing world - known during the Cold War as the Third World - from a predominately rural society to an urban one. For the first time, because of unimpeded population growth and a related shift from rural-based to urban-based societies, more people live in cities in the developing world than in cities in the industrialized world. ... The countries experiencing the

greatest population increases are among the poorest, least developed, and most economically deficient in the world and therefore are largely incapable of feeding and providing for their increasingly impoverished populations. Within the next decade, at least 65 countries (including 30 of Africa's 51 countries) will be completely dependent on food imports. The imposition of this additional financial burden is likely to strain anemic national economies, increase the developing world's indebtedness, and thus widen the chasm already separating "haves" from "havenots" and the Northern from the Southern Hemisphere.<sup>22</sup>

Statistics on the extent of urbanization are enlightening. Great Britain was the only nation with over fifty percent of its population in cities and towns of greater than 20,000 in 1920.<sup>23</sup> By 1960, one in every four people in the world lived in towns and cities of this size. By 1970, twelve percent of the world's people lived in cities of over 500,000. In 1993, 286 cities had over one million residents. By the year 2,000, up to forty-five percent of humans will live in urban areas. It should also be noted that the tide of urbanization is moving fastest in developing countries. In 1950, only three of the world's ten largest cities were in the Third World. In 1993, seventeen of the largest twenty-five were in that category. Further, this rapid growth, combined with limited resources, makes such cities hotbeds of unrest. In some countries the majority of urban residents live in a single city, making it the focus of life for the entire nation. This is particularly significant for nations who face the threat of possible use of weapons of mass destruction by potential opponents.

This exponential growth in cities, both in actual population and as a percentage of the total population, is caused by a combination of several factors.<sup>24</sup> The combined effect of these trends toward increased urbanization and increased competition for resources leads to two conclusions. First, urban combat is more likely simply because there is less undeveloped terrain on which to fight, and because rural areas become less relevant to the political goals of a war as they are stripped of population. Second, with populations growing faster than available resources, the growing social and political tensions will lead to increasing violence as groups compete for those available resources.

Other factors also play a role in making cities likely environments for combat. Roberts and Munger found a number of advantages accrue to groups fighting in the city. They were: reduced levels of social control over individuals; a larger audience for propaganda and

recruiting efforts; the mobility and crowds of the city make it easier to contact friendly foreign governments and like-minded domestic groups to share ideas and obtain aid; increased access to food, money, equipment, and other requirements to support the group; urban terrain is well suited for defense, and also offers a wide range of targets for the offense; the large numbers of civilians provide an effective shield against the massing of government firepower; and the buildings, large numbers of people, and patchwork of streets provide more hiding places and means of escape than are often found in the bush. As one researcher noted: "Insurgents and other groups recognize cities as cultural, political, social, and economic hubs of [the] nation. They are lucrative targets. Press attention is also easier to get in cities."<sup>25</sup> While cities still have the significant disadvantage of greater concentrations of government forces, this disadvantage is often offset by the many advantages.<sup>26</sup>

Another factor leading to more frequent urban combat is the growing importance of cities based on concentrated populations and essential resources. As pointed out by Paul Bracken in his article examining the increasing probabilities of urban combat in Europe:

But cities are strategically important not just because their continued growth threatens to engulf open areas, but because they are communications, economic and population centers. They also are the political nerve centers of the developed nations, and, since all military actions are directed toward political goals, they will be drawn into political and military conflict. Greater urbanization will only increase the tendency for military forces to find themselves located in cities.<sup>27</sup>

This recognition is not new. A 1978 report by the US Army Science Board found senior leaders in the army believed MOUT was inevitable in any likely army contingency.<sup>28</sup> Little was done to translate these expectations into relevant doctrine. Yeoman finds four stumbling blocks that effectively stop progress in American MOUT doctrine. One is that doctrine continues to stress that MOUT is to be avoided and fails to recognize the increasing frequency of situations where it cannot be avoided. Another is that the focus on avoidance provides an excuse for not revising tactics and techniques. A third is the lack of systemic reviews of MOUT issues affects the inventory of weapons available to fight MOUT. There is no requirement to test new weapons for their effectiveness or reliability under MOUT conditions. Finally, this failure to address MOUT materiel requirements results in the replacement of weapon systems that are effective

in MOUT by systems of limited utility when fighting in cities.<sup>29</sup> Several other studies support Yeoman's findings.<sup>30</sup>

Another concept that effectively blocks progress in the field of MOUT doctrine is the idea that well trained units can easily adapt to any conditions and thus can quickly learn urban fighting during a battle. This expectation fails under examination.<sup>31</sup> Lack of specific training in MOUT techniques leads to higher casualties as troops learn through trial and error. To consciously accept the concept of expending soldiers lives to make up for known shortfalls in doctrine and training seems both cruel and unprofessional. A new approach is necessary to resolve this condition. A reevaluation of our current doctrinal approach to MOUT will be discussed after three case studies.

### HISTORICAL PERSPECTIVES

To assist in determining how well the doctrine in FM 90-10 addresses contemporary urban threats, three case histories of contemporary urban combat are presented. The author chose these three cases based on the criteria that they placed a modern mechanized army in opposition to a non-mechanized indigenous urban force. The examples selected are the American intervention into the Dominican Republic, 1965; the Battle of Hue, Republic of Vietnam, 1968; and British Army urban operations in Northern Ireland, 1969-1986.

#### The Dominican Republic, 1965<sup>32</sup>

American interest in the Dominican Republic dates from the completion of the Panama Canal, which focused American attention on the Caribbean. The 1961 assassination of Rafael Leonidas Trujillo Molina, who had ruled the country since 1930, brought on a period of political turbulence and violence that culminated in the outbreak of civil war on 25 April 1965. The fighting escalated quickly, prompting President Lyndon Johnson to order US Marines ashore on 28 April to protect American lives. On 29 April the President ordered the 82d



Airborne Division (82d ABN DIV) to deploy. Their mission was to separate the warring Dominican factions and force a negotiated settlement to the fighting. With the marines holding a perimeter in the city of Santo Domingo and the 82d ABN DIV landing at the airport outside of town, the first mission for the American forces was to secure a land corridor between the two sites. The 1-508th Infantry Battalion of the 82d ABN DIV was selected to lead the way in linking up with the marines.<sup>33</sup> The battalion met light resistance, but learned how sudden and unpredictable urban combat can be. The Dominican rebels would fire a few rounds and then fall back, repeatedly delaying the column. There was no real effort to prevent the Americans from completing the link up, but 1-508th Infantry did suffer casualties. This operation set the tone for the remainder of the American intervention. Rebel snipers were active and seemed to be everywhere. A history of the 1-508th Infantry's participation in the Dominican intervention notes: "While in this area from 11 May until 21 May 1965, the battalion received enemy fire on the average of twenty times daily."<sup>34</sup> The effectiveness of sniper fire is noted by Lawrence Yates in his history of the intervention.

Sniper fire accounted for the majority of American casualties during the intervention. . . . The real terror stemmed from knowing that even when patrolling procedures were executed flawlessly, soldiers still stood exposed to enemy countermeasures. True cover was a luxury. Streets and intersections offered clear fields of fire for rebel gunners. Moreover, few walls or houses could stop even small-arms rounds, and ricochets off pavement or within door ways could often do more damage than a direct hit. Troops also worried about being lured into rebel cross fire. Platoon and squad leaders shared the additional burden of having to be concerned with the adverse effects that casualties might have on unit morale and discipline.<sup>35</sup>

Understandably, the soldiers wanted to fight back. "The troops at first returned the sniper fire, but the rules of engagement restricted their choice of weapons."<sup>36</sup> The rules of engagement [ROE] dictated from Washington fostered a feeling of resentment among the soldiers forced to dodge the incoming bullets. A history of the 1-17th Cavalry notes: "Under the 'no fire' orders, the cavalry found it extremely galling to sit by without returning this fire while the rebels practiced and improved their aim."<sup>37</sup> Veterans of the experience later used words like

"dumb," "crazy," "mind-boggling," "demoralizing," "convoluted," and "confusing" to describe their perceptions of the ROE.<sup>38</sup> These feelings of frustration were summed up in history of the 1-505th Infantry's experiences.

Most of us were now beginning to experience a new phenomena of modern war - political control of military operations. Here again was a condition for which we were not properly trained. We all knew in our hearts that we could beat the rebels with one swift, violent blow. Yet we were ordered to stand fast under rebel guns while the negotiators talked. This was a situation difficult to understand by the young trooper who had been so expertly trained in the techniques of conventional warfare, but who had too little appreciation for the implications of politics in war.<sup>39</sup>

There were other difficulties as well. The Americans quickly realized that, as noted above, their training and doctrine had not adequately prepared them for the conditions they faced in Santo Domingo.<sup>40</sup> They had to learn to deal with unexpected problems like lack of maps,<sup>41</sup> gangs of looters,<sup>42</sup> rebel propaganda broadcasts on radio,<sup>43</sup> and operating civic action programs.<sup>44</sup> They also learned to operate checkpoints, conduct searches and patrols, and secure rebel infiltration routes through the city sewer system. Incidents of varying intensity continued throughout the summer, but by 31 August a formal reconciliation was signed between the warring factions and the rebellion was officially over. This allowed the bulk of US forces to withdraw, although some forces stayed as part of a multinational peacekeeping force until new elections were held and a new president was installed. The last US forces left the Dominican Republic on 21 September 1966.

Important lessons can be learned from the Dominican intervention. One critical lesson is that there is generally little time available for training before sending troops into MOUT. From the start of the crisis to the 82d ABN DIV's deployment was four days. The decision to actually deploy the division was made only two days before the planes began to land and off-load soldiers. Soldiers must be trained before they are needed. Another important lesson is that there is much more to MOUT than proper techniques for clearing buildings of enemy troops. The establishment of roadblocks and checkpoints to control access to rebel areas, the

establishment of an effective intelligence network among the local population, population control, civic action, and joint operations with indigenous forces are just a few of the essential tasks the division had to perform that are not addressed in FM 90-10.

#### The Battle of Hue, 1968<sup>45</sup>

In the early morning hours of 31 January 1968 the combined forces of the North Vietnamese Army (NVA) and the Vietcong (VC) launched an attack aimed at the major cities of South Vietnam. The purpose of the attack was to incite a mass uprising among the population of South Vietnam, thus forcing an end to the Vietnam War. The attack was not completely unexpected. Indications of the buildup to the attack had been noticed as early as September 1967. The surprise that occurred was based on the timing of the attack, the massive size of the attack, and its focus on major cities. Up to this time most fighting had been in the countryside. The most serious threats in the cities were terrorist attacks. That changed on 31 January 1968. With numerous reported attacks to deal with, and many Army of the Republic of Vietnam (ARVN) soldiers on leave for the holidays, all available forces were ordered to attack the NVA/VC forces. This included marines stationed at Phu Bai, near the city of Hue. The marines, riding in trucks and escorted by tanks, got underway by midmorning on 31 January. The experiences of A Company, 1st Battalion, 1st Marines (A/1/1) were typical. They ran into repeated ambushes along the road, but fought back and continued to move into the outskirts of town.

About 100 meters north of the An Cuu Bridge, the lead tank emerged from the 600-meter-long gauntlet into a large, open intersection with a traffic circle in the center. . . . as many as six ARVN M-41 tanks and at least one APC were arrayed around the traffic circle. These had been destroyed during the last of the 7th ARVN Armored Cavalry Battalion's four unsuccessful attempts to relieve the Citadel by attacking straight up Highway 1.<sup>46</sup>

This experience of A/1/1 Marines reinforces two lessons of urban combat. First, armored vehicles are easy prey in cities if not protected by infantry. Second, concealed movement is easy

in a city, allowing defenders who are driven away from an area to easily reoccupy it if the area is not occupied in strength by the attacker. This happened repeatedly to the marines moving into Hue in the first days of the battle. G/2/5 Marines, arriving in Hue on 1 February, quickly learned that it was necessary to secure every room in a building to prevent the NVA/VC from coming back in. The company found "it had to fight a war in three dimensions rather than the usual two."<sup>47</sup>

The marines quickly found they had other lessons to learn as well. Late on 2 February, 2/5 Marines were ordered to leave for Hue the next morning. Their commander, Lieutenant Colonel Ernest Cheatham, "realized that he had received no training in city fighting since he had been a newly minted second lieutenant preparing to depart for the Korean War."<sup>48</sup> Cheatham spent the night reading the 1964 version of FM 31-50. This was probably a case of too little, too late, at least for one of his companies.

By the evening of February 3, the Marines in Fox/2/5 certainly knew something about waging war in a city, but the price of knowledge had come very high. . . . several men had been wounded and medevacked, one man had been killed outright, and one would soon be dead. And all for no gain.<sup>49</sup>

The marines faced other obstacles besides their inexperience. With orders to spare as much of the city as possible, the use of indirect fire and air support was limited. The battle had to be conducted primarily with small caliber direct fire weapons. The battle was waged by squads and platoons, fighting street by street, building by building, and in many cases room by room. Casualty rates were high. Statistically, the time an individual could expect to fight in Hue before being killed or wounded was measured in days.

As in all urban combat, the enemy was not the only challenge. The urban environment presented special dangers. Attacking troops found the city offered little effective cover from enemy fire.<sup>50</sup> Weapons sometimes became as dangerous to the firer as to the enemy.

A dozen NVA had been found hiding in a shed, and they wouldn't come out. The door of the shed was about fifteen feet from the post office, so Carter couldn't fire from there - his own shrapnel would have sprayed right back at him. So he got up on the post office roof, walked up

to the edge, and aimed in, . . . . His rounds still exploded back on him, superficial shrapnel wounds scraping his face.<sup>51</sup>

In another case a 106mm recoilless rifle crew fired their weapon inside a building, collapsing the ceiling and burying the weapon under a pile of debris.<sup>52</sup> Other problems to be faced included gangs of looters,<sup>53</sup> dealing with the American news media,<sup>54</sup> and large numbers of homeless civilians.<sup>55</sup>

Despite the seeming endlessness of the fighting in Hue, the end did come. On 21 February the US 1st Cavalry Division succeeded in cutting off the NVA/VC units inside the city from outside reinforcement. On 25 February the last major NVA/VC opposition was crushed by ARVN forces. On 26 February the city was declared secured.

Two significant lessons were learned from this operation. First, as in the Dominican Republic, rules of engagement (ROE) often dictated that militarily preferable solutions could not be used because of political costs. Second, new weapons were less useful in MOUT than the old weapons they replaced. Three of the most useful weapons in this battle, apart from small arms and handgrenades, were tear gas (CS), the 3.5 inch rocket launcher (bazooka), and the 106mm recoilless rifle. The bazooka and 106mm have both been replaced by weapons less suitable for MOUT operations,<sup>56</sup> and CS requires National Command Authority approval before it can be used.<sup>57</sup>

#### The British Army in Northern Ireland, 1969-1985<sup>58</sup>

The involvement of the British Army in Ireland dates back to 1155 A.D., but emphasis on MOUT began on 15 August 1969 when the Queen's Regiment deployed to Belfast to separate rioting Protestant and Catholic mobs after three days of escalating violence. Initially the soldiers were received more as protectors than as combatants, particularly by the Catholic minority.<sup>59</sup> This benign neutrality ended on 16 October when the British were attacked during

a Protestant riot. As their presence dragged on, they became not merely outsiders to be tolerated, but a foreign occupying army to be opposed.

It was not only the gunmen with whom the soldiers had to deal. Women too, could be a major problem. In most areas their early warning system for the approach of any stranger meant a general stand-to with the banging of dustbin lids and the blowing of whistles. Hundreds of women could gather very fast and become a dangerous menace to a patrol.

Radical elements on both sides had much to gain by provoking confrontations that they could use as propaganda.<sup>60</sup> "... the local view was often, 'Well, the lad's doing no harm, he's only stoning the military.'"<sup>61</sup>

The British recognized this strategy and attempted to defeat it. Despite the escalating levels of violence directed against them the British tried to remain neutral. They also worked to maintain good civil-military relations through community action projects. These efforts had mixed results.<sup>62</sup> Local residents rioted over rumors that soldiers were using the activities as opportunities to meet and seduce young girls. Sports programs had limited participation because children who attended the activities were often beaten and terrorized.

The Provisional Irish Republican Army (PIRA) was very effective at turning Catholics against the British. As PIRA attacks became deadlier, the army conducted a raid to seize weapons. It went badly. Residents turned out in mass to oppose this 'invasion.' The force used proved too small to defend itself and reinforcements were piecemealed into the fight. This allowed crowds to gather and overwhelm them. The army then moved large forces into the Catholic area, enforced curfews, and conducted house-to-house searches for weapons. Many arms were found, but the Catholic community was now openly and uniformly hostile.

During this early period the army found itself on the defensive in public relations. The PIRA could spread rumors faster than the army could disprove them. "The army looked upon the campaign as a 'war situation; and found it difficult to accept that reporters could 'hob-nob with the IRA who were out to kill us.' One general found that he got angry 'almost

every day of my life' over something or other which had been broadcast,...."<sup>63</sup> The army then took the offensive and allowed more media access to their operations. Allowing the media to experience the dangers and frustrations of their missions proved an aid in getting more sympathetic treatment for the army point of view.

In March 1972, in an attempt to reduce the violence, the British reduced army presence in Catholic areas. The plan backfired when the PIRA used their new freedom to declare 'liberated zones,' and began to openly organize in the Catholic areas. By July conditions had grown so bad that the Army was ordered to mount 'OPERATION MOTORMAN' to retake control. The army announced its plan in advance and warned the PIRA to avoid confrontation. The plan worked. There was little opposition as the army moved in with eleven infantry battalions, bulldozers, and bomb disposal experts to reopen the city streets.

After OPERATION MOTORMAN the conflict settled down again into a routine of bombings, sniper attacks, patrols, and civic actions. Unit commanders reported significant difficulties trying to keep units current in both conventional and MOUT doctrine simultaneously. Some soldiers had problems adapting to the changes. "When they arrived in Ulster they were confused by having to blacken their faces and crawl around with weapons, against an enemy they could not identify."<sup>64</sup> The British solution was to establish a two-month training program to prepare units for rotation to Northern Ireland.<sup>65</sup>

The classic procedure for soldiers under fire is to take cover and return the fire. They now had to be taught that the only way to succeed, if at all, was to move forward very fast and straight away start entering houses. . . . However, there were dangers in doing even this regularly, because it could set up a patrol for a devastating ambush. . . . They were taught never to establish patterns: that the 'dicks' would notice where they would stop for a smoke on a particular bit of waste ground or where they might shelter in a particular shop entrance. They were taught that they were watched all the time.<sup>66</sup>

This training proved necessary even though many soldiers were veterans of previous rotations to Northern Ireland. MOUT skills decayed rapidly when not regularly practiced.

Writing about Ulster in 1985, Michael Dewar noted that conditions were much better than they had been when the army arrived in 1969, but that no final solution was in sight. He noted that final military victory was practically impossible when fighting a dedicated enemy able to blend in with a civilian population that would not, or could not, give the fighters away to government forces.<sup>67</sup>

Two significant lessons can be drawn from the operations in Northern Ireland. First, a military force inserted into a tense, hostile situation will quickly become the target of hostility. Acts seen as beneficial to one side of the dispute will automatically be seen by other factions as acts against them, regardless of the original motivation for the acts. This has tremendous implications for future peacekeeping operations. Second, military forces, even when operating within the borders of their own country, will normally be considered outsiders by local inhabitants. This puts the army at a disadvantage against an indigenous armed force that has the support, or at least the tolerance, of the civilian population.

#### FM 90-10 AND CONTEMPORARY URBAN COMBAT

The case studies presented are only three of more than forty major urban battles since 1917.<sup>68</sup> With the occurrence of urban combat demonstrably common and increasingly likely, the next issue is how well our current doctrine addresses the needs of modern urban war.

A key element of effective doctrine is an understanding of enemies the army must be prepared to fight. As stated earlier, FM 90-10 assumes Warsaw Pact forces as the enemy. The case studies make clear that the US can expect to face forces who are not organized like the Warsaw Pact. Perhaps one could have argued in 1979 that it was appropriate to design doctrine around such a unique and specific enemy. That argument became moot when the Warsaw Pact dissolved. The case studies demonstrate that a focus on a mechanized enemy is too narrow; the issue becomes what types of enemies to expect. Here we go back to guidance



quoted earlier from FM 100-5. Contemporary doctrine must be adaptable. As the worst case threat, mechanized forces cannot be ignored. For that reason we must not abandon the lessons of WW II. At the same time we must develop doctrine appropriate for the most likely opponent: relatively small bands of urban fighters armed with light weapons.<sup>69</sup> In a world where both mechanized and light forces are threats, our doctrine must provide guidance suitable for fighting both. Since this paper assumes current MOUT doctrine is still suitable against heavy forces, the remaining discussion will focus on doctrinal changes needed to fight effectively against light indigenous forces.

A. Offense. FM 90-10 begins by stipulating that urban offensive actions fall into the same categories as rural offensive actions. Those are: movement to contact, exploitation, pursuit, and hasty and deliberate attack.<sup>70</sup>

1. How the Enemy Defends. The specificity of current doctrine is demonstrated by the quote: "The enemy always attempts to establish his defense well forward of an urban area in order to engage and defeat the attacker on the approaches to and flanks of the built-up area."<sup>71</sup> The case studies show enemies do not always defend well forward. In each case the enemy established defenses within the city, using the urban terrain to restrict the attacker's movements. The enemy also used civilians as shields from the attacker's firepower. The enemy will defend in the way he feels is most advantageous to himself. As Clausewitz wrote:

War, however, is not the action of a living force upon a lifeless mass (total nonresistance would be no war at all) but always the collision of two living forces. ... So long as I have not overthrown my opponent I am bound to fear he may overthrow me. Thus I am not in control: he dictates to me as much as I dictate to him.<sup>72</sup>

We must prepare for any action the enemy takes. He may dig in and conduct a house-to-house defense as in Hue. Doctrine should discuss how to develop options while operating within the ROE. The other extreme is an enemy that defends no fixed positions as in Northern Ireland. In this case the enemy will try to hide in the population while exhausting the attacker.<sup>73</sup> Our

doctrine must allow for the enemy's free will. The current manual pays little attention to enemy initiative.<sup>74</sup> It says the enemy will try to draw attacking forces into pre-planned kill zones and separate attacking armor from its infantry. This provides little useful guidance. FM 90-10 needs to have examples to illustrate the points being made. It is not enough to warn of potential enemy actions. Doctrine must provide ideas for action, using what has worked or not worked in the past. The object is not to give the reader answers to memorize, but to show possible approaches to different circumstances. Another needed discussion regards enemy use of civilians. An indigenous force can use the local population for intelligence and support far more effectively than can an alien army.<sup>75</sup> This was true in all three case studies. The attacker must understand the relationship between the defender and the population before he plans the attack. Failure to consider this variable ignores an important dynamic of the MOUT battlefield. A third topic for discussion is how the defender can modify the MOUT environment by using booby traps, snipers, and ambushes. While doctrine should not try to provide a method to defeat every possible enemy tactic, it should provide a common framework of thought to help leaders work through problems.

2. Planning the Attack. This section of FM 90-10 begins with the warning that the plan of attack depends on how the enemy defends. Since FM 90-10's description of the enemy's defense is demonstrably faulty, planning considerations based on the enemy defense will not be addressed. This section will focus on planning issues controlled by the attacker.

3. Offensive Operations. The first issue is the familiar warning to conduct an urban attack only as a last resort.<sup>76</sup> This is undoubtedly still good advice, but based on the trends toward urban combat this admonition by itself no longer provides useful information. The manual should acknowledge the trends toward urbanization and urban combat. This is necessary for FM 90-10 to fulfill the role of doctrine described in FM 100-5.<sup>77</sup> Doctrine must

facilitate communication, serve as a basis for Army school curricula, and set the direction for modernization. None of these can happen as long as MOUT doctrine explicitly denies that it should be used.

Another issue is the focus on terrain-oriented objectives. The only force-oriented objective in FM 90-10 is: "Deal the enemy a decisive psychological blow."<sup>78</sup> The manual gives no details on how this should be done. One can assume it means to demonstrate to the enemy that there is no safe place to hide; he can be found and defeated anywhere. While not stated, a related value is the demonstration to the citizens of the city that the enemy does not rule the streets. If significant numbers of civilians remain in the city, the enemy will attempt to use them to his advantage. Those that do not cooperate willingly will be coerced. To show the population that they can cooperate with our forces without fear of reprisal will be key to establishment of an effective intelligence system. The population will only have confidence in our forces if we can protect them from the enemy.<sup>79</sup> This means that in addition to the bridges, transportation hubs, and industrial facilities mentioned in FM 90-10, the military commander must see the people themselves as a critical objective. In the three case studies, population control was a deciding factor in how the battles were conducted. In the Dominican Republic, once the rebels were contained, the tempo of operations dropped as efforts shifted from gaining military control to a focus on convincing the rebels to accept a negotiated settlement. In Hue, government buildings were key objectives for both the NVA and the ARVN/US forces. The value of these buildings did not lie in their contents or locations, but rather in their effect on the perceptions of the population regarding who was in control of the city. From the beginning of the plan for Tet, the North Vietnamese believed the seizure of important towns and the buildings of government were a means to generate a rebellion in the South and so gain control of the South's population. In Ireland, the objective of all sides is the loyalty and support of the

people. This was the factor that led the British first to grant autonomy to the Catholic areas of Belfast, and then, in OPERATION MOTORMAN, retake control. Autonomy was granted in an attempt to convince Catholics that the British government was working in an evenhanded manner for the good of all citizens and so deserved their support. If that support had been given, the British would have stayed out of the autonomous areas. The British quickly discovered, however, that rather than strengthen the ties between the British and Catholics, the autonomous areas strengthened the PIRA. OPERATION MOTORMAN was then required to restore some order and control over the Catholic population. The clear lesson from these cases is that commanders must be prepared to conduct attacks to gain and maintain control of this vital objective, the population.

A third issue is FM 90-10's failure to discuss the political implications of urban combat. Many agree with Clausewitz that there is always a political component to war,<sup>30</sup> but in the past that component was often subordinate to military need. As the cases show, this is seldom the situation any longer. An increasingly political population, more noncombatants present at the scene of the fighting, and greater coverage by the news media all increase the political content of each combat action. These factors increase the limitations commanders face when making military decisions. Commanders must weigh how their use of ROE, formations, weapons, the timing of the attack, the size of the force used, and many other variables will effect the political goals of the battle. FM 90-10 contains the warning: "Civilian casualties and significant collateral damage to structures usually accompany urban operations, requiring commanders to consider the political and psychological consequences before attacking."<sup>81</sup> There is no other guidance. This fails to provide a guidepost that will foster discussion of the issues raised, serve as a foundation for academic instruction, or provide a clear operational direction to guide future modernization.

4. Fundamentals of the Offense. The six fundamentals are: see the battlefield; concentrate overwhelming combat power; suppress enemy defensive fires; shock, overwhelm, and destroy the enemy; attack the enemy rear; and provide continuous mobile support. The fundamentals make sense. If faults exist in FM 90-10's discussion of these topics, the faults lie less in what is said than what is not said.

The first fundamental is to see the battlefield. As FM 90-10 points out, only dense forests can compare with cities for concealment. The city adds additional concealment opportunities through large numbers of noncombatants, a heterogeneous environment that degrades sensor surveillance, and the ability to move forces easily in three dimensions. With sensor surveillance degraded, human intelligence (HUMINT) and reconnaissance become the most reliable means to see the urban battlefield. Both of these activities require the extensive use of patrols to get out and cover the ground. A great deal of useful information can be gained by talking to people on a regular basis, even when dealing with a hostile population.<sup>82</sup> This will require personnel who can speak the language. A shortage of Spanish-speaking troops during operations in the Dominican Republic was a constant source of friction between the commander of the 82d ABN DIV, who had most of the Spanish-speaking soldiers, and the commander of the XVIIIth Airborne Corps who kept trying to take them away for his own use. One option is to pair indigenous police and military personnel with US military forces. The civilian population generally feels more at ease with members of their own society.<sup>83</sup> British forces found this to be true even in Northern Ireland where all sides share a common language. Other reconnaissance considerations include the finding by the British that multiple small patrols working together had better results than a few large patrols. Patrols were more likely to be ambushed if gunmen were confident of a safe escape route. Multiple patrols moving in patterns that gave each other mutual support created doubt in the minds of potential ambushers. In those cases where

ambushes were sprung, the probability of intercepting the enemy was improved dramatically by having more patrols available for maneuver.<sup>84</sup> This is by no means an exhaustive list of factors relevant to seeing the battlefield, but it gives a feeling for the complexity of this seemingly simple requirement.

The second fundamental is to concentrate overwhelming combat power. FM 90-10 speaks of obtaining concentration through the use of deception, mass, combat support assets, and operational security measures (OPSEC). All of these are valuable and necessary. An attacker cannot afford to leave any potential advantage unused. A topic the manual could discuss, but does not, is a definition of mass. Most readers are familiar with the rule of thumb that the attacker needs a ratio of approximately 3:1 to have an even chance of success in an attack.<sup>85</sup> During his research into the dynamics of urban combat, R. J. Yeoman concluded, "Force ratios on the order of 10:1 are generally accepted as being required to successfully attack a well defended urban complex."<sup>86</sup> Yeoman's ratio may not be correct, but if our doctrine does not address the issue there is no impetus to discuss, test, and decide what the ratio should be. This is the state we find ourselves in today. In his study of urban combat, Donald Kirkland looked at the effect of urban combat on US mechanized forces.<sup>87</sup> Armed with Bradley fighting vehicles, a full strength platoon would have only eighteen dismounted soldiers available. These soldiers would have to not only clear their assigned sector, but also protect their vulnerable vehicles. Using historical loss statistics, Kirkland showed that with such low dismount strength an infantry battalion could easily lose 25% of its dismounts in a single day of combat.<sup>88</sup> Kirkland also concluded that this level of loss could not be sustained based on historical replacement rates, to say nothing of the effect that such loss rates would have on unit morale. A method must be found to resolve the organizational and manpower issues raised by Kirkland. The point is that it is doctrine's role to address such issues, and once again, FM 90-10 is silent.

The third fundamental is to suppress enemy defensive fires. The doctrine agrees well with experience. It is better to suppress enemy weapons with direct rather than indirect fire. A number of factors favor this approach. First, Yeoman found indirect fire produced heavy collateral damage and civilian casualties. Politically, both results are strong arguments against indirect fire. Collateral damage produces military drawbacks as well, generating rubble which slows and canalizes vehicle movement, usually to the advantage of the defender. Rubble actually improves the defensibility of urban terrain by making enemy positions harder to locate, isolate, and attack.<sup>89</sup> The manual urges the use of the least destructive direct fire weapon that will accomplish the mission, thus reducing civilian casualties, collateral damage, and unnecessary rubbing. For hardened targets, tank main guns, attack helicopters, and artillery in direct fire are effective. While they are very destructive, their ability to destroy enemy positions with a single round can result in greater effect with less damage than if multiple rounds from smaller or less accurate weapons are used. The effectiveness of these weapons is, however, dependent on the type of ammunition used.<sup>90</sup> An anti-tank sabot round, for example, is of little use as it punches a small hole and can often penetrate multiple buildings before stopping. Projectiles using high explosive charges, such as high explosive plastique (HEP), are better suited for urban combat. They do not over-penetrate, they make larger holes in buildings (aiding the entry of infantry), and their destructive energy is directed to the sides as well as directly forward, increasing the chances of an effective shot even when the aim is imprecise. The manual also fails to address the use of PGM and lasers in MOUT. This is not surprising given the state of development of PGMs and lasers in 1979. These technologies are now integral parts of the fire support system and doctrine needs to be updated to address them.

The fourth fundamental is to shock, overwhelm, and destroy the enemy. The manual places a great deal of stress on maintaining the momentum of the attack and allowing follow-on

forces to clear buildings and destroy by-passed enemy forces. A look at past uses of these methods should give us pause. This is an area where open, active debate and systematic testing seem needed. As Michael Dewar points out in his survey of urban battles, leaving enemy forces behind in urban combat is completely different, and more dangerous, than by-passing enemy forces in a rural setting.

... urban combat calls for a much greater degree of thoroughness. Unlike the rural situation, where the maintenance of speed and momentum may be more important than clearing every copse and fold in the ground, it is a different matter altogether when clearing buildings. Every room, cellar and attic must be cleared, checked and rechecked. It is a dangerous and painfully slow business, but the only way to get the job done.<sup>91</sup>

An example of what Dewar is talking about occurred on the first day of fighting in Hue. Both ARVN and US forces had orders to get into town rapidly to reinforce compounds that were under attack. Columns had to fight their way through a gauntlet of enemy fire, creating a temporary corridor through the NVA positions. Since each column was under orders to keep moving, the NVA were able to re-close the roads after the departure of the column, thus forcing the next column to fight the same battle and suffer additional casualties retaking the same buildings and street intersections.<sup>92</sup> This fighting again highlighted the advantage urban terrain provides to the defender by allowing protected tactical movement into and out of the battle area. An even more disturbing example of the dangers of by-passing enemy forces to maintain momentum occurred in the 1973 Arab-Israeli war when the Israelis attempted to capture the town of Suez City.<sup>93</sup> The plan called for a rapid attack into the center of town by a combined armor-infantry column. Once the center of the city was secured, the force would begin working their way back out towards the edges securing buildings as they went. The Egyptians expected these tactics. Their plan to defeat the attack was not to stop the column, but to have sequences of fire teams hit the column at selected ambush sites, then retreat before the Israelis could bring effective counterfire to bear. As the Israelis would shift fires to engage the next set of fire teams, the first attackers would return to firing positions and attack again. The



Egyptian plan worked well. Virtually all of the Israeli armored vehicles were destroyed. With their armor lost the Israeli infantry had no choice but to occupy buildings and defend themselves until dark, when they were finally able to disengage and exfiltrate out of town.<sup>94</sup> While tactics of the kind discussed under this fundamental have been successfully used against fortified defensive lines, this author was unable to find an example where this tactic was successfully used in urban combat. It is only speculation on the author's part, but it seems this fundamental may have been lifted unquestioningly from standard rural combat doctrine without an attempt to establish its validity in an urban setting. However this concept came to be in FM 90-10, the author suggests it requires testing and formal validation before it is retained in any future update.

The fifth fundamental is to attack the enemy rear. This is a logical goal, meshing with the concept of battlefield depth. The problem is FM 90-10's concept of the enemy rear is far more linear than that used in the Army today. The case studies do not support a conclusion that:

The attack and isolation of forward defenses disrupt combat service support functions. It [sic] also demands that the defender employ his combat service support elements, thus aiding the attacker in locating and destroying them.<sup>95</sup>

The manual's fixation on an enemy with support requirements equivalent to our own is evident. Still, the concept of undercutting the enemy's support system is sound. The modification this author recommends is to broaden the focus of the idea and attack other sources of support in addition to military resources. Psychological operations to woo away civilian supporters who provide food, intelligence, and other help is as much an attack on the enemy 'rear' as an attack on an arms cache. Another factor is the issue of finding enemy logistics assets. In an urban environment it is often difficult to identify enemy support facilities. They are usually inside buildings and can be camouflaged easily. They will often be

decentralized and dispersed. An excellent intelligence network is required to locate the support facilities for attack.

The sixth and final fundamental is to provide continuous mobile support to our own forces. Yeoman found the impact of urban combat on the support branches varied by the type of mission performed.<sup>96</sup> These impacts ranged from very significant for engineers, military police, and civil affairs units; to moderate for supply, maintenance, and communications units; down to no significant impact for medical and materiel handling units. In general, the internal doctrines of the individual support branches had a greater impact on their ability to adapt to the requirements of a MOUT environment than the doctrine contained in FM 90-10.

5. Planning Considerations. The discussion in this section is largely technical, covering such subjects as hasty and deliberate attacks, security and intelligence requirements, and commonly used control measures to maintain coordination between adjacent units. The only area requiring comment is the manual's discussion of deliberate attacks. The deliberate attack is described as consisting of three phases: the isolation of the objective, the assault on the objective, and the clearance of seized territory. Issues relating to the assault and clearance phases were discussed under fundamentals of the offense. The concept of isolating the objective will be discussed now.

The doctrine contained in FM 90-10 calls for the objective to be isolated by securing dominating terrain outside the city. This worked well during the battle of Hue. The problem is that cities around the world are growing past the point where they have clear boundaries. Even if boundaries can be established, the physical size of the perimeter is often too great for an effective blockade.<sup>97</sup> It makes sense to use external cordons if possible, but the leader must have alternatives. One option is to establish a cordon around a specific part of the city. This was the method used by US forces in the Dominican Republic. Strict controls over persons and

materiel passing through the cordon were imposed. This type of cordon is less effective than an external cordon because long range surveillance and fire support will normally not be effective. Further manpower savings can be made by using terrain to help cover part of the cordon line. In the Dominican Republic the sea effectively surrounded the rebels on two sides. Wide rivers, hills, and tall buildings can also serve as force multipliers when enforcing a cordon. Helicopters are useful to quickly drop off forces that can seize key points required to establish the cordon.<sup>98</sup>

Another option is the approach used by the British in Northern Ireland. Physically isolating their enemy was impossible because individual identification of the enemy was difficult. The British response was a program to prevent PIRA supporters from providing aid to PIRA gunmen even when contact between the two groups could not be prevented. While not as effective as a cordon, it overcame the political and manpower conditions that made a cordon impossible. The typical program consisted of:

1) Control the movement of a population by issuing identification cards and establishing a system of police surveillance. 2) Control access to food, clothing, and medical supplies by imposing a rationing system. 3) Increase police powers under emergency conditions to allow increased powers for detention, curfew, wide powers of arrest, seizure of property, destruction of property, checkpoints, house search and proclamation of restricted and controlled areas. 4) Establish centralized operational control with police and military cooperation to include an integrated intelligence collection and evaluation effort. 5) Conduct psychological operations concurrently ... to win the cooperation of the public.<sup>99</sup>

B. Defense. Many of the comments previously made about offensive MOUT doctrine are equally relevant to defensive doctrine. An example is the previous discussion of FM 90-10's fixation on the Warsaw Pact as opposed to more likely enemies. To avoid redundancy, these topics will not be covered again. The discussion in this section will focus on issues related to the urban defense that have not been covered in previous sections.

1. How the Enemy Attacks. An enemy is likely to be more cunning and resourceful than is reflected in FM 90-10. No allowance is made for the flexibility and creativity of the opposing commander, as shown by the statement:

Threat force structure and offensive tactics incorporate the concepts of mass, maneuver, and speed. Daily offensive rates of advance of 60-100 kilometers are expected during nuclear operations, and 30-60 kilometers under conventional conditions.<sup>100</sup>

This tunnel vision ignores types of attack for which US forces must be prepared. Three types of attack that come to mind are attritional attacks to wear down US resolve and morale; attacks on control of the population by fomenting civil unrest, strikes, and riots to discredit and distract American forces;<sup>101</sup> and attacks to destroy politically important facilities to demonstrate the powerlessness of the US force.<sup>102</sup>

The first type of attack is the attritional attack. This is designed to kill and wound as many soldiers as possible. Even if no one is hurt, the attack succeeds if it raises feelings of danger and foreboding among the defending troops. Typical methods used in these attacks are hit-and-run raids, snipers, and mortar attacks. If performed properly, these attacks can have many benefits for the enemy force, such as publicity, boosting morale, gaining intelligence, and destroying materiel targets. This type of attack is most common for a force that perceives itself as significantly weaker than the US, and so decides to fight a protracted war to try to outlast US commitment.<sup>103</sup> Countering enemy initiatives requires good security, reconnaissance, and intelligence programs.

Another option is to attack US operations indirectly through civil unrest. Crowds can be gathered and whipped into violence by the agitation and misinformation of enemy agents. In other cases agitation by enemy agents is not necessary, as populations can become so accustomed to violence and confrontation that civil unrest becomes 'normal.'<sup>104</sup> This is a problem unique to urban environments because rural populations are too scattered to obstruct operations. Regardless of the reasons for the unrest, once violence is initiated it can escalate rapidly. The British Army found this to be true during their initial intervention into Northern Ireland. Once a military force is on the ground it may already be too late to win the local

population's acceptance and approval. Psychological operations and civil affairs units must be placed in the theater as quickly as possible to begin building rapport. Working to prevent civil unrest and interference to military operations is far easier and more efficient than trying to correct problems after they have begun.

The third type of attack is the enemy raid directed at materiel targets, such as radio stations, television stations, and government buildings. The object of these attacks, like the attrition and civil unrest discussed above, is more political than military. Most enemies of the US quickly learn that their forces cannot withstand the casualties that result from head-on confrontations with US firepower and technology. This forces enemies to look for other targets that both advance their cause and spare their fighters. Destruction of high visibility facilities meets these criteria. This is largely an urban challenge since vulnerable targets are usually located in cities. There are never enough forces to perform all needed missions and protect all vulnerable places, so sites must be prioritized for defense. How commanders think about priorities and then train, organize, and equip their forces to deal with these issues are matters of doctrine. FM 90-10 discusses how an enemy can be expected to use artillery and air power against us, but fails to address the potential enemy use of demolitions to accomplish the same goals.<sup>105</sup> This is a gap in FM 90-10's doctrine that needs to be filled.

2. Planning the Defense - Defensive Operations. This section of FM 90-10 outlines the elements needed to begin defense planning. The only significant shortcoming is the failure to adequately address the offensive options and capabilities of potential enemies. Since this topic has already been discussed in the previous section, it will not be covered here.

3. Fundamentals of the Defense. FM 90-10 lists five fundamentals. They are to understand the enemy, see the battlefield, concentrate at the critical times and places, fight as a combined arms team, and exploit the advantages of the defender. The manual makes the point

that these fundamentals are no different than those that apply to rural combat environments. As with many other things, the differences lie not in what they are, but in how they are used.

The first fundamental, understanding the enemy, is important because a successful defense depends on the ability to predict and prepare for the enemy's actions. This is the perspective contained in FM 90-10. This perspective does not go far enough. FM 90-10 recommends that the defending commander mentally place himself in the role of the attacking commander and attempt to discover the plan the enemy commander is likely to choose. What FM 90-10 does not discuss is the probability that the enemy commander is doing the same thing. In his analysis of MOUT training in the US Army, David Reiss suggests that knowing the attacker is important not only to be able to predict what he will do, but also to predict what the enemy thinks the defender will do.<sup>106</sup> The defender should then do something different. This may sound complicated, but it is not. Reiss suggests that if the routine is to defend from inside buildings, sometimes the commander should establish his defensive positions outside buildings. If the positions are camouflaged correctly and deception is used, the attacker will waste time and resources trying to destroy positions where he thinks they are, instead of where they exist. This is only a single example of an approach to defense that offers limitless possibilities. Reiss's point is that our knowledge of the enemy is partially wasted if we only use it to predict what the enemy will do. At least half of the utility of knowing the enemy is the insights it gives into how better to deceive him. This value, based on the use of innovation, flexibility, and adaptability, is not mentioned in FM 90-10.

The second fundamental is to see the battlefield. This refers to having more timely and accurate knowledge of the positions, actions, and conditions of both friendly and enemy units on the battlefield than the enemy, and favors the defense because the defense owns the terrain

where the battle will take place. A discussion of the doctrinal implications of this topic was made during the discussion of the offense.

The third fundamental is to concentrate at critical times and places. FM 90-10 discusses how the defender can concentrate by successfully predicting where forces will be needed and prepositioning them, and by maintaining superior mobility over the enemy.<sup>107</sup> This is difficult to achieve in battle.<sup>108</sup> An advantage for the defender is that the attacker must also concentrate. The defender then only needs to concentrate to the extent necessary to defeat the attack. The defender can help insure his own concentration is adequate by actively disrupting the attacker's attempts to concentrate.<sup>109</sup> Plans to identify and preempt the enemy when he tries to concentrate is exactly in keeping with the doctrine of FM 100-5.

The defender disrupts the attacker's tempo and synchronization by countering his initiative and preventing him from massing overwhelming combat power. ... They do this by defeating or misleading enemy reconnaissance forces, separating the enemy's forces, isolating his units, and breaking up his formations so that they cannot fight as part of an integrated whole.<sup>110</sup>

It seems that FM 100-5 is agreeing with Clausewitz's observation that "... the defensive form of war is not a simple shield, but a shield made up of well-directed blows."<sup>111</sup> FM 90-10 lacks the element of offense in its defensive doctrine. This must be changed to bring the manual in line with other Army doctrine.

The fourth fundamental calls for fighting as a combined arms team. This is common in US doctrine. The difference is that it is typical in MOUT to form combined arms teams at lower tactical levels than in rural combat. Past experience shows combined arms teams as low as squad level.<sup>112</sup> FM 90-10 should explicitly discuss low echelon team building to provide a doctrinal basis for these formations.

The last fundamental is to exploit the advantages of the defender. The reader will recall that the physical environment of the urban battlefield provides many advantages to the defense, allowing lightly armed defenders to successfully turn back attackers with up to ten

times greater combat power.<sup>113</sup> These advantages were already discussed as part of the urban combat environment.

4. Planning Considerations. In discussing planning for the defense, FM 90-10 states, "The basic roles of the covering force, main battle, and rear areas remain unchanged."<sup>114</sup> When fighting against another mechanized army this may be true, but in all three of our case studies it was not true. The modern urban battlefield is often fluid, with no discernible front line, main battle area, or protected rear area. In many cases combatants from both sides, along with the citizens, mix and mingle on a regular basis. Finding the best solution for reorganizing and renaming the components of the fluid battlefield is beyond the scope of this paper, but some ideas come to mind that may be useful in thinking through how the fluid battlefield should be organized. One way to organize the battlefield is based on relative security. Terms such as "secured," "contested," and "hostile," could be assigned depending on the relative friendly or enemy influence in the area. These terms would provide useful information to troops patrolling or traveling through an area. These terms would also provide useful information to local commanders as they track their progress in pacifying the city. Meaningful use of such terms would depend on an accurate and reliable intelligence reporting system to track the status of city areas over time. The command climate would have to reward honesty to insure reported conditions accurately reflected actual conditions on the street. A second option is to describe areas in a functional way, based on the type of operations routinely conducted there. Areas could be described as "observed," "patrolled," or "occupied." This form of organization would provide a useful means for testing the results obtained against the manpower assigned to the area. Other frameworks could also be developed. The issue remains the need for a new approach to describe the urban battlefield which uses terms and concepts more appropriate to MOUT than the outmoded terms used in FM 90-10.



Another planning consideration ignored in FM 90-10 is the need for higher densities of soldiers to defend a given area in MOUT than are required for an equivalent rural area.<sup>115</sup> The high density of soldiers is required because the excellent cover and concealment offered by urban terrain provides almost unlimited opportunities for infiltration throughout the city. Doctrine should openly address issues of this kind. In this case, guidance is needed on acceptable standards for determining defensive manpower requirements. The current FM 90-10 does not fill this need.

### CONCLUSIONS

Having examined the history of MOUT doctrine in the US Army since WW II, the contemporary environment in which MOUT is likely to be required, three case histories describing how MOUT has been conducted against asymmetric forces in the past, and the current shortcomings of FM 90-10 as the capstone manual of US Army MOUT doctrine, the following conclusions are drawn:

First, MOUT training is important. This author's research uniformly supports the conclusion that urban combat will become more frequent in the years ahead. American involvement in operations requiring peacekeeping and peacemaking operations further increase the probability of US forces fighting in urban combat in the near future.<sup>116</sup> Even now, urban combat is not uncommon to the US military. There have been three significant urban battles since 1990.<sup>117</sup> Experience shows that military training for rural combat does not transfer well to urban combat.<sup>118</sup> This was evident in each of the case studies as well as in every other urban battle examined by the author. Yet we continue to send our troops to conduct MOUT without adequate urban training. This insufficiency of training results in needless casualties.

Second, fixing our MOUT doctrine is the necessary first step in any program to improve our MOUT fighting capability. Doctrine is designed to be the foundation upon which to build our training programs, organize our forces, and determine what essential equipment the forces need in order to fight and win. If MOUT doctrine is not relevant to the actual conditions our soldiers can expect to meet on the modern urban battlefield, then it will not serve any of its essential functions. Our soldiers will continue to be improperly prepared to meet the challenges of MOUT.

### RECOMMENDATIONS

First, leaders in the army must shoulder the responsibility of seeing MOUT as a real and immediate threat. Without leader involvement there will be no interest in MOUT. The saying "Units do well what the boss checks," is a cliché. It is also true. Leaders from the top down must demand training of and performance in MOUT skills based on relevant doctrine, or the next urban battle will result in needless casualties and lost opportunities just like battles in the past.

Second, doctrine must be updated and made relevant. As the bibliography of this document shows, the research to support a revision of MOUT doctrine has already been done. The actions needed to improve our doctrine are clear. The only required action is for Training and Doctrine Command (TRADOC) to accept the challenge, take all the studies down off the shelves where they have been gathering dust, and update the doctrine.

Next, with an updated doctrinal manual, TRADOC will have the necessary foundation to update the educational requirements related to MOUT. It will not be enough merely to provide information. There must be realistic tasks, conditions and standards assigned to MOUT activities to support evaluation. Not all of this training can be done with textbooks in a classroom. The best possible solution is to include MOUT tasks as part of unit Army Training

and Evaluation Program (ARTEP) tasks. The problem with this solution is that it requires training facilities realistically replicating a variety of urban environments. These training facilities are expensive to build, expensive to maintain, and there will never be an adequate number of facilities available. A possible solution is to use computer simulations.<sup>119</sup> Different simulations can be used to train different tasks, ranging from individual soldiers selecting and fortifying an individual fighting position in a building, to commanders and staffs conducting collective training on the tasks required to track, coordinate, and sustain the battles of subordinate units in the disjointed and difficult environment of a city.

Fourth, with a relevant doctrine as a base, the army needs to reexamine the organizational structure of forces expected to fight in urban terrain. Light forces alone lack the fire support assets they need to fight efficiently when they meet a well dug in enemy. Heavy forces lack the infantry manpower to sustain themselves in urban combat for significant lengths of time.<sup>120</sup> There are several potential solutions to this dilemma. One solution is to create heavy/light combined arms task forces through task organization. These forces would have a habitual relationship and train together regularly. There are several other potential solutions to this dilemma as well. The point is that current organizations and doctrine are inadequate to meet the mission. Change is necessary. The issue is to test and then select an acceptable solution that will resolve the problem.

Finally, there is a need to relook both our current inventory of weapons and our weapon procurement procedures to insure the army has weapons available that are suitable for use in MOUT.<sup>121</sup> This will require a joint effort involving both TRADOC and Army Materiel Command (AMC). The current problem is two-fold. One, the current weapons in the army inventory were primarily designed to defeat Warsaw Pact forces at long range. Many of the features that were necessary for long range lethality run counter to effective MOUT

employment.<sup>122</sup> The 3.5 inch rocket launcher (bazooka), 106mm recoilless rifle, and M-3 submachinegun were all excellent MOUT weapons that are no longer in the army inventory. In each case, these weapons were replaced by weapons of improved lethality, but less utility in urban combat. Second, as a new weapon is designed, there is no systematic review and evaluation for effectiveness in urban environments. Troops find it difficult to fight effectively if they are not given appropriate weapons. The solution is to mandate evaluation of our current weapons to determine if they are adequate for MOUT, or if new weapons must be immediately purchased. Regardless of the efficacy of our current inventory, a requirement should be placed on all future procurements of close combat weapons that they be evaluated starting in the concept stage as to their effectiveness for urban combat. This is not to say that every weapon purchased in the future must be designed to work well in MOUT, but if it does not work, it will be because of a conscious decision by the eventual user. This would be a great improvement over the current situation in which weapons are purchased without an effective MOUT capability because no one has responsibility to test for such a capability.

In summary, combat in urban environments is an ancient form of combat, but it has never been a preferred method of fighting. Urban combat is slow, attritional warfare, without any of the dash that is often associated with combat in the field. It has long been the province of the desperate making a last stand because they no longer had the strength to meet an enemy in the open. It has long been a type of warfare that soldiers preferred to ignore in the hope that they would never have to fight it. Unfortunately, the world has changed. As the evidence has shown, strong social, economic, and demographic tides are moving the world's population from a rural base to an urban base. Urban combat is becoming more frequent. As it becomes more frequent, we must be prepared for MOUT or our soldiers will have to pay the price for our unpreparedness. We must remember that our adversaries have at least as much influence over

future combat conditions as we do. The words of Carl von Clausewitz are as relevant today as they were at the time he penned them:

If the political aims are small, the motives slight and tensions low, a prudent general may look for any way to avoid major crises and decisive actions, exploit any weaknesses in the opponent's military and political strategy, and finally reach a peaceful settlement. If his assumptions are sound and promise success we are not entitled to criticize him. But he must never forget that he is moving on devious paths where the god of war may catch him unawares. He must always keep an eye on the opponent so that he does not, if the latter has taken up a sharp sword, approach him armed only with an ornamental rapier.<sup>123</sup>

## Endnotes

<sup>1</sup> Thucydides. History of the Peloponnesian War. Translated by Rex Warner. London: Penguin Books, 1972, pp.124-127.

<sup>2</sup> Representative criticisms of current US MOUT doctrine can be found in the following documents: Michael Dewar. War in the Streets: The Story of Urban Combat from Calais to Khafji. Devon, Great Britain: David & Charles plc, 1992, p.78. Michael J. Dormeyer. Adequacy of Doctrine for Armor in MOUT. Unpublished thesis, Fort Leavenworth, KS: US Army Command and General Staff College, 1983, p.9. John R. Kennedy. Players or Spectators?: Heavy Force Doctrine for MOUT. Unpublished monograph, Fort Leavenworth, KS: School of Advanced Military Studies, 1990, pp.44-47. John J. Mahan. MOUT: The Quiet Imperative. Unpublished monograph, Carlisle Barracks, PA: US Army War College, 1983, pp.1-6.

<sup>3</sup> Department of the Army. Field Manual 100-5, Operations. Washington, DC: US Government Printing Office, 1993, p.1-1.

<sup>4</sup> Mahan, p.3.

<sup>5</sup> David W. Reiss and others. Survey of Current Doctrine, Training, and Special Considerations for Military Operations on Urbanized Terrain (MOUT). Unpublished research report, Fort Benning, GA: Research Institute for the Behavioral and Social Sciences, 1983, p.5.

<sup>6</sup> Ibid. p.8.

<sup>7</sup> The determination that current US MOUT doctrine is a direct evolution from US experiences in WW II is noted in the following documents: Robert Boyko. "JUST CAUSE, MOUT Lessons Learned," Infantry, May-June 1991, p.28. John F. Meehan. "Urban Combat: The Soviet View," Military Review, September 1974, p.41.

<sup>8</sup> Reiss, p.3.

<sup>9</sup> FM 31-50, Combat in Fortified Areas and Towns. Washington, DC: US Government Printing Office, 24 July 1952, pp.51-97.

<sup>10</sup> Ibid. p.71.

<sup>11</sup> Ibid. p.56.

<sup>12</sup> FM 31-50, Combat in Fortified and Built-up Areas. Washington, DC: US Government Printing Office, 10 March 1964, p.30.

<sup>13</sup> C. N. Donnelly. "Soviet Tactics for Fighting in Built-Up Areas: A New Look for the 1980's," International Defense Review, Volume 18, Number 7, 1985, p.1067.

<sup>14</sup> Meehan, p.43.

<sup>15</sup> John F. Pettine. MAU Helicopter Operations in Urban Areas. Unpublished monograph, Newport, R.I.: Naval War College, 1985, pp.2-3.

<sup>16</sup> R. J. Yeoman. General Urban Warfare Amphibious Logistics Applications. Volume I: Technical Report. Quantico, VA: Marine Corps Development and Education Command, 1983, p.II-4.

<sup>17</sup> The following sources provide useful observations on the key factors that make the urban combat environment so different from the rural combat environment, along with discussions of the practical effects of those differences: George Schecter. Analysis of Munitions Effectiveness in Built-Up Areas Overseas

for U.S. Army Munitions Command. A summary report by Kentron, Inc., under contract (Contract No. DAA-21-72-C-0784, 1972) to the US Army, Arlington, VA: Kentron, Inc., 1973, pp.4-5; B. D. Wheeler. "Military Operations in Built-Up Areas," Infantry, July-August 1977, p.35; Reiss, pp.4-5, 8, 30-31.

<sup>18</sup> Yeoman, p.II-2.

<sup>19</sup> Ibid. p.EX-11.

<sup>20</sup> Kenneth E. Roberts and Muriel D. Munger. Urban Guerrillas in the Americas. Carlisle Barracks, PA: Strategic Studies Institute, US Army War College, 1976, p.14.

<sup>21</sup> James O'Connell. Is the United States Prepared to Conduct Military Operations on Urbanized Terrain? Newport, RI: Naval War College, 1992, p.32.

<sup>22</sup> Jennifer Morrison Taw and Bruce Hoffman. The Urbanization of Insurgency: The Potential Challenge to U.S. Army Operations. Santa Monica, CA: RAND, 1994.

<sup>23</sup> Russell W. Glenn. Unpublished notes in support of research conducted while the Senior Army Fellow at the RAND Arroyo Center.

<sup>24</sup> Roberts and Munger, p.4.

<sup>25</sup> Glenn. Unpublished notes.

<sup>26</sup> Ibid. pp.4-5.

<sup>27</sup> Paul Bracken. "Urban Sprawl and NATO Defense," Military Review, October 1977, p.32.

<sup>28</sup> Mahan, p.7.

<sup>29</sup> Yeoman, p.II-2.

<sup>30</sup> The following sources provide support for Yeoman's position that blocks exist to the effective development of the doctrinal, materiel, and training resources required to effectively prepare US forces to fight in an urban environment: Patrick O'Sullivan and Jesse W. Miller, Jr., The Geography of Warfare. New York: St. Martin's Press, 1983, p.134; Bracken, p.36; Taw and Hoffman, p.25.

<sup>31</sup> Mahan, p.9.

<sup>32</sup> The chronology of events described in this section are based on the work of Lawrence A. Yates. POWER PACK: U.S. Intervention in the Dominican Republic, 1965-1966. Fort Leavenworth, KS: Combat Studies Institute, 1988.

<sup>33</sup> Robert F. Barry (ed.). POWERPACK: Dominican Republic, 1965-1966. Portsmouth, VA: Messenger Printing Co., 1965, p.24.

<sup>34</sup> Ibid.

<sup>35</sup> Yates, pp.122-124.

<sup>36</sup> Ibid.

<sup>37</sup> Barry, p.29.

<sup>38</sup> Yates, p.142.

<sup>39</sup> Barry, p.34.

<sup>40</sup> Barry, p.38, and Yates, p.124.

<sup>41</sup> Yates, p.93.

<sup>42</sup> Barry, p.34.

<sup>43</sup> Yates, p.131.

<sup>44</sup> Barry, p.24 and p.38, and Yates, p.133.

- <sup>45</sup> The chronology of events described in this section are based on the work of Eric M. Hammel. Fire in the Streets: The Battle for Hue, Tet 1968. Chicago, IL: Contemporary Books, Inc., 1991.
- <sup>46</sup> Ibid. p.65.
- <sup>47</sup> Ibid. p.105.
- <sup>48</sup> Ibid. p.134.
- <sup>49</sup> Ibid. p.154.
- <sup>50</sup> Keith William Nolan. Battle for Hue: Tet 1968. Novato, CA: Presidio Press, 1983, p.13. Hammel, p.87 and p.143.
- <sup>51</sup> Nolan, p.53.
- <sup>52</sup> Ibid. p.50. The issue of structural damage to buildings from the firing effects of weapons is an important one. LTC Russell W. Glenn has conducted extensive research on the topic of MOUT while the Senior Army Fellow at the RAND Arroyo Center. In a conversation with the author at the School for Advanced Military Studies, US Army Command and General Staff College, Fort Leavenworth, Kansas, on 12 December 1994, LTC Glenn noted: "This problem is not uncommon. Examples of indirect fire weapons (mortars and artillery) causing building collapse due to their positioning on roofs or within enclosed areas are numerous. Internal injuries to soldiers servicing weapons in enclosed spaces has occurred even when structures remained intact."
- <sup>53</sup> Ibid. pp.86-88.
- <sup>54</sup> Ibid. p.102 and p.108.
- <sup>55</sup> Ibid. p.183.
- <sup>56</sup> Paul Jureidini and R. D. McLaurin. "Lebanon: A MOUT Case Study," Military Review, August 1979, p.9.
- <sup>57</sup> Department of the Army. FM 3-100, NBC Operations. Washington, DC: US Government Printing Office, 1985, p.1-2.
- <sup>58</sup> The chronology of events described in this section are based on the work of Michael Dewar. The British Army in Northern Ireland. London: Arms and Armour Press, 1985.
- <sup>59</sup> Desmond Hamill. Pig in the Middle: The Army in Northern Ireland. London: Methuen London Ltd, 1985, p.17.
- <sup>60</sup> Ibid. p.32.
- <sup>61</sup> Ibid. p.279.
- <sup>62</sup> Ibid. p.279.
- <sup>63</sup> Ibid. p.168.
- <sup>64</sup> Ibid. pp.23-24.
- <sup>65</sup> R. B. Pengelley. "Internal Security - Some Recent British Developments," International Defense Review, October 1973, p.621.
- <sup>66</sup> Hamill, pp.140-141.
- <sup>67</sup> Dewar. Northern Ireland. pp.227-228.
- <sup>68</sup> Department of the Army. FM 90-10-1, An Infantryman's Guide to Combat in Built-Up Areas. Washington, DC: US Government Printing Office, 1993, p.1-2.
- <sup>69</sup> John R. Moore. "Future Warfare May Take the Form of Urban Terrorism," Marine Corps Gazette, June 1979, p.52.
- <sup>70</sup> Department of the Army. FM 90-10, Military Operations on Urbanized Terrain (MOUT). Washington, DC: US Government Printing Office, 1979, p.1-2.



- 71 Ibid.
- 72 Carl von Clausewitz. On War. Edited and translated by Michael Howard and Peter Paret. Princeton, NJ: Princeton University Press, 1976, p.77.
- 73 Thomas M. Schlaak. "The Essence of Future Guerrilla Warfare," Marine Corps Gazette, December 1976, p.21.
- 74 William R. Desobry. "Brute Strength, Not Finesse," Infantry, July-August 1987, p.9.
- 75 Hammel, p.22.
- 76 FM 90-10, 1979, p.2-7.
- 77 FM 100-5, 1993, pp.1-1 to 1-2.
- 78 FM 90-10, 1979, p.2-8.
- 79 Enrique Martinez Codo. "The Urban Guerrilla," Military Review, August 1971, p.4.
- 80 Clausewitz, p.87.
- 81 FM 90-10, 1979, p.2-8.
- 82 Desobry, p.10.
- 83 Schlaak, p.25.
- 84 Hamill, pp.74-76.
- 85 US Army Command and General Staff College. Student Text 100-9, The Command Estimate Process. Fort Leavenworth, KS: US Army Command and General Staff College, 1992, p.3-4.
- 86 Yeoman, p.II-2.
- 87 Donald E. Kirkland. Offensive Operations in Urban Europe: The Need for a "Heavy" Light Infantry Force. Fort Leavenworth, KS: School of Advanced Military Studies, US Army Command and General Staff College, 1985, pp.32-33.
- 88 Kirkland's computations of the 25% loss rate are based on a 9-man squad with the driver, gunner, and track commander remaining with the vehicle. With 6 dismounts per squad, times 3 squads, times 3 platoons, times 4 companies, Kirkland determined the number of dismounts for an infantry battalion to be 216 ( $6 \times 3 \times 3 \times 4 = 216$ ). This is out of a full authorization for the battalion of 844 soldiers of all skills. According to casualty planning data contained in FM 101-10-1, Volume 2, an infantry battalion in urban combat could expect to lose 6.6% of its strength as casualties in a single day, with 93% of that number being infantrymen ( $844 \times 6.6\% \times 93\% = 52$ ). Of the infantrymen lost, Kirkland assumes the bulk of the losses will be among the dismounted infantry due to their greater exposure and vulnerability ( $52 \text{ infantry casualties} / 216 \text{ dismounts} = \text{approx } 24\%$ ).
- 89 Yeoman, p.EX-11.
- 90 Glenn. Unpublished notes.
- 91 Dewar, War in the Streets, p.87.
- 92 Hammel, pp.69-77.
- 93 Kennedy, pp.16-19.
- 94 Yeoman, p.IV-8.
- 95 FM 90-10, pp.2-11 to 2-12.
- 96 Yeoman, p.EX-15.
- 97 Meehan, p.41.
- 98 Schechter, p.10.
- 99 Schlaak, p.26.

- 100 FM 90-10, 1979, p.3-1.
- 101 Philip D. Caine. "Urban Guerrilla Warfare," Military Review, February 1970, p.77.
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